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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
MUHAMMED, ABDUKADER S	
ART UNIT	PAPER NUMBER
2627	

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/18/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/18/2007.

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mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/802,740	CHEN, HON-LUN	
	Examiner	Art Unit	
	Abdukader Muhammed	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 6, 9, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Ueno et al. (US 5,234,737).

Regarding Claim 1, Ueno et al. teach a phase change optical disk, comprising: a substrate (substrate 1; see figure 2); a first dielectric layer, which is formed on the substrate (protective layer 2 formed on the substrate 1 made up of three layers; the first layer is SiO_2 layer with n_p=1.45; see figure 2 and column 6, lines 13-16) a second dielectric layer, which is formed on the first dielectric layer, wherein the refractive index n2 of the second dielectric layer is greater than the refractive index n1 of the first dielectric layer (the second layer is formed on the first and with n_q=1.9 which is greater n_p =1.45 of the first layer; see figure 2 and column 6, lines 13-17); a third dielectric layer, which is formed on the second dielectric layer, wherein the refractive index n3 of the third dielectric layer is less than the refractive index n2 of the second dielectric layer (the third layer is formed on the second layer made from SiO_2 with n_p =1.45 which is less than the second layer's n_q =1.9; see figure 2 and column 6, lines 13-20) ; a recording layer, which is formed on the third dielectric layer (recording layer 3 is formed on the third layer; see figure 2); a fourth dielectric layer, which is formed on the recording layer (a fourth layer 4 made

of SiO_2 is formed on the recording layer; see figure 2) and a reflecting layer, which is formed on the fourth dielectric layer (a reflecting layer 5 is formed on the fourth layer 4; see figure 2).

Regarding Claim 6, as applied to claim 1 above and Ueno et al. further teach that the first dielectric layer is made of silicon dioxide (protective layer 2 formed on the substrate 1 made up of three layers; the first layer is SiO_2 layer with n_p=1.45; see figure 2 and column 6, lines 13-16).

Regarding Claim 9, as applied to claim 6 above and Ueno et al. further teach that the third dielectric layer is made of silicon dioxide (the third layer is formed on the second layer made from SiO_2; see figure 2 and column 6, lines 13-20).

Regarding Claim 11, as applied to claim 1 above and Ueno et al. further teach that the material of the reflecting layer is selected from the group consisting of gold, aluminum, titan, copper, chromium, and the alloy thereof (reflective layer 5 is made of Al-Ti; see column 5, lines 25-27).

3. Claims 1, 4-9, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyamoto et al. (US 6,231,945 B1).

Regarding Claim 1, Miyamoto et al. teach a phase change optical disk, comprising: a substrate (substrate 1; see figure 2); a first dielectric layer, which is formed on the substrate (heat diffusion layer 2 formed on the substrate 1 made of Al_2O_3; see figure 2 and column 27, lines 12-14) a second dielectric layer, which is formed on the first dielectric layer, wherein the refractive index n2 of the second dielectric layer is greater than the refractive index n1 of the first dielectric layer (protective layer 3 is formed on the heat diffusion layer 2 and is made form ZnS which has

higher refractive index than Al_2O_3; see figure 2 and column 27, lines 12-15); a third dielectric layer, which is formed on the second dielectric layer, wherein the refractive index n3 of the third dielectric layer is less than the refractive index n2 of the second dielectric layer (the lower surface protective layer 4 is formed on the protective layer 3 made from SiO_2 which has lower refractive index than ZnS; see figure 2 and column 27, lines 12-16) ; a recording layer, which is formed on the third dielectric layer (recording layer 5 is formed on the lower surface protective layer 4; see figure 2); a fourth dielectric layer, which is formed on the recording layer (upper surface protect layer 6 made of SiO_2 is formed on the recording layer 5; see figure 2 and column 27, lines 12-18) and a reflecting layer, which is formed on the fourth dielectric layer (a reflecting layer 11 is formed on the upper surface protect layer 6; see figure 2 and column 27, lines 12-20).

Regarding Claim 4, as applied to claim 1 above and Miyamoto et al. further teach that the phase change optical disk is suitable for an optical disk driver with a long wavelength light source (wavelength of 600 to 660 nm; see column 15, lines 13-17).

Regarding Claim 5, as applied to claim 4 above and Miyamoto et al. further teach that the long wavelength light source is a red light laser diode (wavelength 600 to 660 nm is in the red range; see column 15, lines 13-17).

Regarding Claim 6, as applied to claim 1 above and Miyamoto et al. further teach that the first dielectric layer is made of silicon dioxide (the heat diffusion layer 2 formed on the substrate 1 made of materials including SiO_2, Al_2O_3 and others; see figure 2 and column 3, lines 1-7).

Regarding Claim 7, as applied to claim 1 above and Miyamoto et al. further teach that the first dielectric layer is made of aluminum oxide (the heat diffusion layer 2 formed on the substrate 1 made of Al_2O_3; see figure 2 and column 27, lines 12-14).

Regarding Claim 8, as applied to claim 1 above and Miyamoto et al. further teach that the second dielectric layer is made of ZnS-SiO_2 (materials of the protective layer include ZnS-SiO_2; see column 5, lines 26-28 and column 5, 37-40).

Regarding Claim 9, as applied to claim 6 above and Miyamoto et al. further teach that the third dielectric layer is made of silicon dioxide (the lower surface protective layer 4 is formed on the protective layer 3 made from SiO_2; see figure 2 and column 27, lines 12-16).

Regarding Claim 11, as applied to claim 1 above and Ueno et al. further teach that the material of the reflecting layer is selected from the group consisting of gold, aluminum, titan, copper, chromium, and the alloy thereof (reflective layer 11 is made of Al-Ti; see figure 2 and column 27, lines 12-16 and for the list of more materials see column 6, lines 32-50).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 4, 5, 7and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kikitsu et al. (US 6,240,060 B1).

Regarding Claim 1, Kikitsu et al. teach a phase change optical disk, comprising: a substrate (substrate 11; see figure 1); a first dielectric layer, which is formed on the substrate (third dielectric layer 12 formed on the substrate 11; see figure 1) a second dielectric layer, which is formed on the first dielectric layer (the second dielectric layer 13 is formed on the third dielectric layer 12; see figure 1); a third dielectric layer, which is formed on the second dielectric layer (the first dielectric layer 14 is formed on the second dielectric layer 13; see figure 1) ; a recording layer, which is formed on the third dielectric layer (recording layer 15 is formed on the first dielectric layer 14; see figure 1); a fourth dielectric layer, which is formed on the recording layer (upper dielectric layer 16 is formed on the recording layer 15; see figure 1) and a reflecting layer, which is formed on the fourth dielectric layer (a reflecting layer 17 is formed on the upper dielectric layer 16; see figure 1).

Kikitsu et al. differ from the claimed invention in that it does not specifically teach that the refractive index n2 of the second dielectric layer is greater than the refractive index n1 of the first dielectric layer and the refractive index n3 of the third dielectric layer is less than the refractive index n2 of the second dielectric layer. But from the teachings of Kikitsu et al. it is obvious that the refractive index of the second dielectric layer can be made to be greater than the first and third dielectric layers. The rationale is as follows: since Kikitsu et al. teach that the three dielectric layers (in the order of first to third layer) can have refractive indexes of small/large/small combination (see column 14, lines 57-65. Note that this gives $n2>n1$ and also $n3<n2$ as described in the instant invention) one of ordinary skill in the art at the time the invention was made would have been able use such a sequence of dielectric layers as long as

each of the three layers have dielectric constants which differ from that of the adjacent layers (see column 14, lines 17-20).

Regarding Claim 4, as applied to claim 1 above and Kikitsu et al. further teach that the phase change optical disk is suitable for an optical disk driver with a long wavelength light source (wavelength of 660 nm; see column 9, lines 6-7).

Regarding Claim 5, as applied to claim 4 above and Kikitsu et al. further teach that the long wavelength light source is a red light laser diode (wavelength 660 nm is in the red range; see column 9, lines 6-7).

Regarding Claim 7, as applied to claim 1 above and Kikitsu et al. further teach that the first dielectric layer is made of aluminum oxide (the materials employable for the first to third dielectric layers include SiO_2, Al_2O_3; see column 14, lines 17-41).

Regarding Claim 10, as applied to claim 7 above and Kikitsu et al. further teach that the third dielectric layer is made of aluminum oxide (the materials employable for the first to third dielectric layers include SiO_2, Al_2O_3; see column 14, lines 17-41).

6. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. (US 5,234,737) as applied to claim 1 above, further in view of Oomachi et al. (US Publication 2004/0076908 A1).

Regarding Claim 2, Ueno et al. teach the limitations of claim 1 for the reasons discussed above. Ueno et al. differ from the claimed invention in that it does not specifically show that the phase change optical disk is operated with a short wavelength light source.

Oomachi et al. on the other hand teach a multilayer optical disk used with short wavelength light source (see page 4, paragraph [0058], lines 1-4 and figure 20). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a laser with short wavelength in the system of Ueno et al. since Oomachi et al. teach that storage capacity of a phase change recording medium can be increased by shortening the wavelength of a light source (see page 1, paragraph [0006], lines 1-3).

Regarding Claim 3, as applied to claim 2 above and Oomachi et al. further teach that the short wavelength light source is a blue light laser diode (see page 1, paragraph [0006], lines 6-7).

Conclusion

7. The prior art made of record in PTO-892 Form and not relied upon is considered pertinent to applicant's disclosure.

Yoshinari et al. (US 6042921) teach a phase charge type optical recording medium comprising on both sides of a recording layer multi dielectric layers, each containing zinc sulfide and silicon oxide as main components (see figure 2).

Okubo (US 6064642) teaches a phase charge type optical recording medium comprising on both sides of a recording layer multi dielectric layers, each containing zinc sulfide and silicon oxide as main components (see figure 1).

Okubo (US Publication 2001/0055268 A1) teaches a phase change optical disk with a multilayered structure obtained by sequentially forming multiple lower dielectric layers, recording layer, upper dielectric layer, and reflective layer on a substrate (see figure 7).

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abdukader Muhammed whose telephone number is (571) 270-1226. The examiner can normally be reached on Monday-Thursday 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571) 272-7582. Customer Service can be reached at (571) 272-2600. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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11 April 2007

WAYNE YOUNG
SUPERVISORY PATENT EXAMINER